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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/099,764	03/15/2002	Andrew R. Young	6925-310	9158

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PENNIE & EDMONDS LLP
 1155 Avenue of Americas
 New York, NY 10036-2711

EXAMINER

MEINECKE DIAZ, SUSANNA M

ART UNIT	PAPER NUMBER
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3623

DATE MAILED: 06/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

6A

Office Action Summary	Application No.	Applicant(s)	
	10/099,764	YOUNG ET AL.	
	Examiner	Art Unit	
	Susanna M. Diaz	3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 70-93 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 70-93 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3/15/02</u> | 6) <input type="checkbox"/> Other: _____ |

5-15-05

DETAILED ACTION

1. This non-final Office action is responsive to Applicant's election filed April 7, 2005.

Applicant has elected Group I.

Applicant has cancelled claims 18-69 and added claims 70-93.

Claims 1-17 and 70-93 are presented for examination.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 6-11, 14, 70, 72, 84-89, 92, and 93 are unpatentable over Dembo (U.S. Patent No. 5,799,287) in view of Lupien et al. (U.S. Patent No. 5,689,652).

Dembo teaches a computer method for adjusting portfolios of fixed income instruments comprising:

[Claims 1, 3, 8] storing in memory of at least one computer digital data representing portfolio holdings ("The portfolio manager uses the input device 4 to enter information relating to the target portfolio, any current holdings available for use in generating a replicating portfolio, and the time period for which a hedge is desired.", column 7, lines 31-34; Fig. 1);

storing in the memory of at least one computer digital data representing constraints that define trading requirements of the party holding the portfolio, including system constraint information ("... the user identifies ranges of values for any uncertain parameters (for example, volatility, yields, beta) to be used in calculating the future value of the instruments specified. These ranges of values define the future states with respect to which the hedge, state price vector and risk/reward profile will be created. Finally, the user assigns a weight to each of the values in the ranges to indicate an estimate of the relative probability of a particular future state actually occurring.", column 5, lines 18-25; "... the present invention identifies a set of transactions required to achieve an optimal hedge by analyzing the portfolio replication according to a stochastic model which takes into account the trade-off between the cost of the hedge and the quality of protection it offers.", column 4, lines 17-21);

converting, using at least one computer, the digital data representing the portfolio and the digital data representing the constraints of the party holding the portfolio to optimization digital data adapted for processing by an optimization engine ("Using these values, the system then creates an instance of an optimization model designed to create a hedge portfolio that replicates the target portfolio ...", column 5, lines 34-37); and

optimizing using at least one computer the optimization digital data so as to generate a set of trades in accordance with the constraints of the party, which may define relationships between instruments that should be satisfied in a resultant portfolio, such that the portfolios are substantially optimized with respect to a predetermined

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objective ("Following the preprocessing step, the system uses an optimization method to solve the optimization model ...", column 5, lines 39-40);

[Claims 14, 88] wherein the predetermined objective is programmed as an objective function ("Following the preprocessing step, the system uses an optimization method to solve the optimization model ...", column 5, lines 39-40. By following constraints to trade in accordance with a desired objective, an objective function is understood to be integrated into the rules for matching);

[Claims 2, 89] wherein the optimization digital data representing pricing information for fixed-income instruments of the portfolios, the pricing information being provided by an unbiased source, wherein the unbiased source is not a publicly-available database ("Additional information may be provided through the real-time data feed 10, and may consist of an interface to a real-time stock information service such as that provided by 'REUTERS, LTD.'", column 7, lines 35-38).

Dembo does not, however, explicitly teach that the portfolios adjusted by this method may be the holdings of multiple parties. Lupien teaches crossing network that matches buy and sell orders of multiple parties ("For the purpose of explanation assume a batch process in which multiple traders enter satisfaction density profiles that represent either buy or sell orders for a particular stock. ... The CMC will then calculated, for every buy/sell profile pair, a mutual satisfaction cross product. The mutual satisfaction cross product represents the degree to which that buy/sell pair can satisfy each other.", column 4, lines 10-20). It is old and well-known that establishing a

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network of multiple participants among which to trade increases the likelihood of each participant locating a respective buyer or seller for desired financial instruments. Both Dembo and Lupien are directed toward optimizing trades for achieving a desired portfolio and Lupien further enhances the optimization techniques taught by Dembo; therefore, the Examiner submits that it would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify Dembo to optimize trades for multiple parties, as taught by Lupien in order to provide Dembo's users with increased likelihood of locating a respective buyer or seller for desired financial instruments. Such a system of multiple users would necessarily yield a system wherein the multiple parties comprise two or more affiliated parties, and the portfolio holdings comprise at least one fixed income instrument held by at least one of the two or more affiliated parties (claim 70), wherein the defined trading requirements comprise distinct trading requirements for each of the two or more affiliated parties (claim 72). If the two or more affiliated parties had the exact same trading requirements, then no trades would likely take place.

[Claim 92] As per claim 92, Dembo in view of Lupien, as cited above, teach all of the limitations of claim 1. Lupien further discloses the converting of digital data stored in memory representing portfolio and constraint data into a matrix digital data suitable for processing by the optimization engine ("The satisfaction density profile is a two-dimensional grid or matrix ... that as a whole characterizes the trader's degree of satisfaction for a transaction at each ... coordinate.", the "mutual satisfaction cross product" is then computed between matrices for each satisfaction density profile

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combination using matrix operations. See column 3, line 54 - column 4, line 26.). The use of this matrix further optimizes trades among multiple participants. Both Dembo and Lupien are directed toward optimizing trades for achieving a desired portfolio and Lupien further enhances the optimization techniques taught by Dembo (as discussed above); therefore, the Examiner submits that it would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to further modify the Dembo-Lupien combination to convert digital data stored in the memory representing portfolio and constraint data into a matrix digital data suitable for processing by the optimization engine in order to more accurately optimize trades among multiple participants, as taught by Lupien.

[Claim 6] As per claim 6, Dembo in view of Lupien, as cited above, teach all of the limitations of this claim except that user constraints may contain digital data representing par-value weighted attributes. Par-value weighted attributes are described on page 15 of the specification as being essentially the same as market-value weighted attributes except that a par-value is used instead of a market-value as the constraint. The examiner takes official notice that the use of a par-value for a constraint instead of a market-value is well-known in the art of fixed income instruments portfolios and is typically used in reference to bonds. It would have been obvious to one of ordinary skill in the art, at the time of the invention to combine the teachings of Dembo in view of Lupien, as cited above, with the use of a par-value in place of a market-value, because it is advantageous to a party to an investment to set as a constraint a par-value, or a

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goal value rather than just a market-value, especially when bonds are the fixed income instrument of choice.

[Claim 7] As per claim 7, Dembo in view of Lupien, as cited above, teach all of the limitations of the claim except that the user constraints include digital data representing proceeds bounding within sectors. The examiner takes official notice that the use of constraints such as proceeds bounding within sectors is old and well-known in the art of fixed income instrument portfolios. It would be obvious to one of ordinary skill in the art to combine the teachings of Dembo in view of Lupien, as cited above, with the well-known practice of proceeds bounding within sectors because it is advantageous to limit fixed income instruments within portfolios to certain market sectors to ensure a certain performance similarity among all of the commodities within the portfolio (which is well-known in the prior art).

[Claim 93] As per claim 93, Dembo in view Lupien, as cited above, teach all of the limitations of this claim except that the step of converting may include parsing the user constraints and building a data structure stored in memory of at least one computer as a tree data structure. The examiner takes official notice that the use of tree data structures are well-known in the art of computer storage. It would have been obvious to combine the teachings of Dembo in view of Lupien, as cited above, with the well-known technique of storing data as a tree data structure because this would facilitate the graphic display of the user constraints, which is desirable according to Lupien.

[Claim 9] As per claim 9, Dembo in view of Lupien, as cited above, teach all of the limitations of this claim except that the system constraints may contain bond

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conservation constraints. The examiner takes official notice that the use of bond conservation constraints is old and well-known in the art of fixed income instrument portfolios. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to combine the teachings of Dembo in view of Lupien, as cited above, with the well-known practice of using bond conservation constraints as system constraints because this constraint sets a good benchmark for the portfolio (which is well-known in the prior art, especially in regard to the trading of bonds).

[Claim 10] As per claim 10, Dembo in view of Lupien, as cited above, teach all of the limitations of this claim except that the system constraints may include proceeds neutrality constraints. The examiner takes official notice that the use of proceeds neutrality constraints is old and well-known in the art of fixed income instrument portfolios. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to combine the teachings of Dembo in view of Lupien, as cited above, with the well-known practice of using proceeds neutrality constraints as system constraints because this prevents parties from pulling their money out of less profitable investments within the portfolio (which is well-known in the prior art).

[Claim 11] As per claim 11, Dembo in view of Lupien, as cited above, teach all of the limitations of this claim except that the system constraints may include mutual exclusion digital data for avoiding churning. The examiner takes official notice that the use of mutual exclusion digital data for avoiding churning is old and well-known in the art of fixed income instrument portfolios. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to combine the teachings of Dembo in view of

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Lupien, as cited above, with the well-known practice of using mutual exclusion digital data for avoiding churning because churning generates spurious book loss which would be undesirable to parties holding fixed income instrument portfolios (which is well-known in the prior art).

[Claim 84] As per claim 84, Dembo in view of Lupien, as cited above, teach all of the limitations of claim 1. Lupien further teaches that digital data stored in computer memory, representing the constraints of multiple participants may be organized into a formal grammar (Lupien teaches that the constraints of multiple participants may be expressed in matrix form or in graphical form and that the purchases and sales are stored in formatted databases.). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to combine the teachings of Dembo in view of Lupien, as cited above, with the further teaching of Lupien that digital data stored in a computer representing the constraints of multiple participants may be organized into a formal grammar, because it is desirable to express such constraints in a manner that is easily assimilated by all who are familiar with the subject matter, and such formal grammar would allow this to be the case (which is well-known in the prior art).

[Claims 85-87] As per claims 85-87, Dembo in view of Lupien, as cited above, teach all of the limitations of this claim except that the formal grammar: includes a representation of logical relationships among sectors; includes specifying bounded linear constraints; or comprises specifying base attributes and normalization attributes of the constraints. The examiner takes official notice that the expression of

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relationships among sectors, bounded linear constraints and base attributes and normalization attributes of user constraints expressed in formal grammar is well-known in the art of fixed income instrument portfolios, wherein each of these pieces of information is important to understanding the constraints listed in the formal grammar. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to combine the teachings of Dembo in view of Lupien, as cited above, with the well-known expression of relationships among sectors, bounded linear constraints and base attributes and normalization attributes of user constraints expressed in formal grammar because each of these pieces of information is important to understanding the constraints listed in the formal grammar, and expression of this constraint information in formal grammar provides for easily assimilating such information (which is well-known in the prior art).

4. Claims 4, 5, 90, and 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dembo in view of Lupien, as applied to claims 1 and 3 above, and further in view of Applicant's admitted prior art.

[Claim 90] As per claim 90, Dembo in view of Lupien, as cited above, teach all of the limitations of this claim except that the step of optimizing comprises computer processing of a linear programming problem. Applicant's admitted prior art on page 1 of the specification teaches that "[i]t is also known to employ computers that execute optimization programs such as programs based on linear programming techniques, so as to achieve financial goals." Therefore, it would have been obvious to combine the

teachings of Dembo in view of Lupien, as cited above, with the teachings of Applicant's admitted prior art because this is a common mode of programming and is logically suited to the job of optimizing for the purposes taught in Dembo and Lupien more efficiently.

[Claim 91] As per claim 91, Dembo in view of Lupien, as cited above, teach all of the limitations of this claim except that the step of optimizing comprises computer processing of a mixed integer programming problem. Applicant's admitted prior art on page 18 of the specification teaches that the manual for CPLEX optimization software used in the preferred embodiment of the invention "provided for solving mixed-integer linear programming" (lines 3-11) in 1995. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention to combine the use of such mixed-integer linear programming for optimization of fixed income instrument portfolios because such a technique of optimization was utilized in popular software at the time of the invention and would have provided a more efficient way to achieve such optimization.

[Claims 4, 5] As per claims 4 and 5, Dembo in view of Lupien, as cited above, teach all of the limitations of this claim except that the user constraints include digital data representing duration neutrality constraints or convexity neutrality constraints. Applicant's admitted prior art teaches that the programming optimization may be constrained by duration and convexity on page 2 of the specification, and that these "optimization techniques for financial applications are known." (lines 27-36). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention,

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to combine the teachings of Dembo in view of Lupien, as cited above, with the Applicant's admitted prior art concerning duration and convexity constraints because these techniques for financial applications were well-known at the time of the invention, according to Applicant, and would aid in more efficient optimization of portfolios.

5. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dembo in view of Lupien, as applied to claim 14 above, and further in view of Champion et al. (U.S. Patent No. 5,126,936).

As per claims 15-17, Dembo in view of Lupien, as cited above, teach all of the limitations of these claims except that the objective function may maximize tax deductions, total book loss or tax deferral. Champion teaches a system of automatically trading assets that takes into account the tax implications sought by a customer. "The choice will depend upon the tax implications sought by the customer. In this way, the customer can select assets for transactions to minimize the capital gain or maximize capital loss." (col. 8, lines 37-40). That such tax implications taken into consideration would include maximizing tax deductions and tax deferral is old and well-known in the art of financial management. Similar to Dembo and Lupien, Champion is directed toward optimizing financial goals; therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to combine the teachings of Dembo in view of Lupien, as cited above, and the teachings of Champion that take into account the tax considerations of the customer such as maximizing tax deductions, tax deferrals and total book loss, because in the event of a loss of invested commodities, it is

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desirable to minimize the financial impact of such a loss by taking all of the tax advantages allowed by the law (which is well-known in the prior art).

6. Claims 12, 13, 71, and 73-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dembo in view of Lupien, as applied to claims 1, 8, and 70 above, and further in view of "Self-Regulatory Organizations."

[Claims 12, 13, 71, 73, 83] As per claims 12, 13, 71, 73, and 83, neither Dembo nor Lupien expressly teaches that the system constraints may include mutual exclusion digital data for avoiding wash sales and trading between subsidiaries of the same parent. However, "Self-Regulatory Organizations" discusses how the prevention of "fictitious trades, wash transactions, and prearranged trades" are considered important to promote fair trade (as suggested by the fact that the Spokane Stock Exchange, Inc. has requested the adoption of such a standard by the Securities and Exchange Commission, see page 1). It should be noted that trading among subsidiaries of the same parent would effectively be a fictitious trade or wash transaction as far as the financial statements of the parent company are concerned. Since both Dembo and Lupien are directed toward trading financial instruments, the practices of which are governed by the Securities and Exchange Commission in the United States, the Examiner submits that it would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to further modify the Dembo-Lupien combination to incorporate a safeguard that includes mutual exclusion digital data to prevent wash sales and trading between subsidiaries of the same parent (as per claims 12, 13, and

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83) in order to conform to accepted fair trade practices, as suggested by "Self-Regulatory Organizations." Claims 71 and 73 recite limitations directed to preventing the two or more affiliated parties from buying the at least one fixed income instrument, thereby reducing the likelihood of trades between the two or more affiliated parties. The Examiner submits that such practices are suggested by "Self-Regulatory Organizations" since they both serve to prevent unfair trading practices among subsidiaries of the same parent company. Similarly, modification of the Dembo-Lupien combination to conform to such practices (as recited in claims 71 and 73) would have been obvious to one of ordinary skill in the art at the time of Applicant's invention for the same reason presented above (i.e., to conform to accepted fair trade practices, as suggested by "Self-Regulatory Organizations").

Claim 73 additionally recites "if the at least one fixed income instrument is held by at least one party other than the two or more affiliated parties, then said system constraints comprise a constraint that requires the amount of the at least one fixed income instrument bought by the two or more affiliated parties to be less than the amount of the at least one fixed income instrument sold by all parties other than the two or more affiliated parties." This limitation essentially boils down to allowing a subsidiary to purchase a fixed income instrument from another subsidiary of the same parent only if the fixed income instrument is not available at a cheaper price from another source. Buying a fixed income instrument at the cheapest available price is good industry practice because it saves the purchaser money. Therefore, the Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time of Applicant's

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invention to further modify the Dembo-Lupien combination to incorporate the feature that "if the at least one fixed income instrument is held by at least one party other than the two or more affiliated parties, then said system constraints comprise a constraint that requires the amount of the at least one fixed income instrument bought by the two or more affiliated parties to be less than the amount of the at least one fixed income instrument sold by all parties other than the two or more affiliated parties" in order to save the purchaser of a fixed income instrument money by encouraging him/her to purchase the instrument at the cheapest price possible.

[Claim 81] As per claim 81, Dembo in view of Lupien, as cited above, teach all of the limitations of this claim except that the system constraints may include non-negativity and boundedness constraints. The examiner takes official notice that the use of non-negativity and boundedness constraints is old and well-known in the art of fixed income instrument portfolios. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to combine the teachings of Dembo in view of Lupien, as cited above, with the well-known practice of using non-negativity and boundedness constraints as system constraints because this practice prevents the parties holding the portfolios from going into debt over negative or non-bounded investments (which is well-known in the prior art).

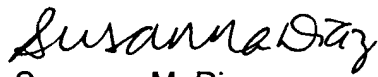
[Claims 74-80, 82] Claims 74-80 and 82 recite limitations already addressed by the rejection of claims 1, 4, 5, 6, 7, 9, 10, and 11 above, respectively; therefore, the same rejection applies.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susanna M. Diaz whose telephone number is (571) 272-6733. The examiner can normally be reached on Monday-Friday, 10 am - 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Susanna M. Diaz
Primary Examiner
Art Unit 3623

June 24, 2005